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ABSTRACT

The selection of students qualified for teacher education has many facets, only some of which are addressed by standardized tests and college grades. The purpose of the present study was to examine the American College Testing (ACT) Program Assessment, Pre-Professional Skills Test (PPST), and college grade point average (GPA) as predictors of student teacher classroom performance as measured by three instruments from the Teacher Performance Assessment Instruments (TPAI). Subjects were 610 teacher education students completing student teaching practicums during the fall and spring semesters of 1987-90 at Idaho State University. Data revealed relationships between the subtest and composite scores of the ACT, subtest scores of the PPST, and GPA. The highest magnitude correlations were found for PPST Reading and ACT English with all other subtest scores and college grades. These data suggest the importance of verbal skills, especially reading, in relation to academic achievement. Academic measures, including standardized tests and college grades, were weak predictors of actual classroom performance of student teachers in this study based on the TPAI instruments. These academic measures (ACT, PPST, and GPA) do not strongly suggest themselves as criteria for teacher education program admission. (IAH)

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Selecting the Qualified:

Predictors of Student Teacher Performance

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Selecting the Qualified: Predictors of Student Teacher Performance

In response to the demand for improved teacher quality and increased accountability, many colleges and universities have established academic criteria for admission to teacher education or student teaching. According to a National Center for Education Information survey (Feistritzer, 1989), more than 75% of the 1,287 responding institutions use college grade point average as a criterion for admission to teacher education. Furthermore, 60% of the responding institutions require minimum scores on some kind of standardized test at college entrance, teacher education program entrance, and/or teacher education program exit.

Academic standards for admission to teacher education are seen by proponents as means to screen unqualified individuals, to strengthen the profession, and to attract better qualified candidates (Rudner, 1988). Programs differ, however, in terms of when they screen potential teachers, standards of performance, and which criteria are used. These issues precipitated the present study examining academic achievement measures (i.e., standardized test scores and college grades) as criteria for teacher education program entrance and their relationships with subsequent student teaching performance.

Purpose of Study

The purpose of the present study was to examine the American College Test (ACT), Pre-Professional Skills Tests (PPST), and college grade point average as predictors of student teacher classroom performance as measured by three instruments from the Teacher Performance Assessment Instruments

(TPAI). Toward that end, answers to the following questions were sought:

1. What are the relationships between ACT subtest scores, PPST subtest scores, college grade point average, and TPAI subtest scores?

2. What are the relative contributions of ACT scores, PPST scores, grade point average, gender, age, and paraprofessional teaching experience to the prediction of student teacher classroom performance?

Method

The present study comprises three phases of a longitudinal project investigating the validity of the ACT, PPST, and grade point average as criteria for teacher education program entrance at Idaho State University.

Subjects

Subjects of the study included 610 (93%) of the 658 teacher education students completing student teaching practicum during the fall and spring semesters of 1987-1990 at Idaho State University. Because these students were required to complete student teaching during the last semester of their teacher education program, the majority (n = 594) were in their senior year of college. Sixty-seven were graduate students working on teacher certification only. Most of the students were elementary (n = 356) or secondary (n = 256) majors. Other majors included special education and speech pathology. There were 146 (24%) males and 464 (76%) females in the sample.

The submission of ACT scores is a requirement for admission to Idaho State University. A minimum college grade point average of 2.50 (on a 4.0 scale) is required for admission to the Teacher Education Program and to student teaching practicum. The submission of PPST scores is also a

requirement for admission to the Teacher Education Program, and all 610 student teachers had taken the PPST between September of 1985 and December of 1989. Because minimum cut-off scores had not been established at the time of the present study, no students were excluded from the Teacher Education Program and, as such, from the study on the basis of PPST scores.

Instrumentation

American College Test. The ACT covers content that should have been acquired during high school (American College Assessment Program, 1983) and consists of four separately timed sections measuring English usage, social studies, natural sciences, and mathematics usage. The student must take all four sections of the test. Standard scores are reported for each subtest on a scale of 0-36 with a composite score computed by summing all subtest scores.

Pre-Professional Skills Tests. Developed by the Educational Testing Service in 1983 as a basic skills measure for program admission, the PPST consists of three subtests assessing reading, writing, and mathematics. skills. Raw scores are reported separately for each subtest on a scale of 150-190; there is no composite score. The tests cover content that should have been acquired during high school and the early college years (Educational Testing Service, 1983).

Teacher Performance Assessment Instruments. Student teacher classroom performance was measured by the TPAI (Capie, Johnson, Anderson, Ellett, & Okey, 1979). The five instruments of the TPAI (Teaching Plans and Materials, Classroom Performance, Interpersonal Skills, Professional Standards, and Student Perceptions) were designed to determine how well

classroom teachers can demonstrate certain minimal teaching skills which are considered to be essential to good teaching (Capie, Ellett, & Johnson, 1980). Of the five instruments, three are recommended for certification purposes and were used in the present study:

1. The Teaching Plans and Materials Instrument measures skills related to planning for instruction. The teacher being rated is asked to prepare a written instructional unit and trained data collectors then study the teaching plans and rate instrument items related to planning, selecting objectives, and choosing materials and equipment.

2. The Classroom Procedures Instrument allows trained raters to measure skills related to actual instructional practices within the classroom setting. Direct observation becomes the major source of data.

3. The Interpersonal Skills Instrument measures a teacher's ability to create a comfortable social setting, demonstrate warmth and friendliness, and manage classroom interactions. As with the Classroom Procedures Instrument, ratings are based on actual classroom observation.

The three instruments of the TPAI consist of 45 broad statements of generic teaching competencies. For each teaching competency, competency indicators are listed in order to define behaviors representative of the competency. The more indicators a teacher demonstrates proficiently, the more likely it is that the teacher demonstrates the target competency. The third order of item classification and scoring is a set of sentence-length statements called descriptors. Scored on a scale from 1 to 5, descriptors are more specific than competencies or indicators and are used to describe the quality of a teacher's performance relevant to a competency indicator.

The general TPAI scoring procedures require the data collector to rate the teacher being assessed on each indicator by assigning a number (on a scale from 1 to 5) to represent the descriptor which best defines the teacher's behavior. The final score for any competency is a mean which ranges from 1.00 to 5.00. The sum of mean scores on all competencies of each instrument then becomes the total score for that instrument. A separate score is provided for each of the three instruments; a total score is computed by summing the scores of the three instruments.

The validity of the TPAI has been investigated in a variety of studies. Content validity was examined through a nationwide experts' opinion study which sought to verify the competencies, their indicators, and descriptors as essential for teaching (Johnson, Okey, Capie, Ellett, & Adams, 1978). Descriminant validity was investigated by comparing the TPAI scores of beginning teachers with those of more experienced teachers (Ellett, Johnson, Capie, and Okey, 1978). Construct validity was examined through a factor analysis of competencies and indicators (Ellett et al., 1978). Criterion-related validity was investigated by correlating elementary and secondary teacher TPAI scores with a variety of criterion variables such as student achievement on standardized and teacher-made tests and observations of student "on-task" behavior (Okey, Capie, Ellett, & Johnson, 1978). In all instances, evidence obtained from these studies is supportive of the validity of the TPAI.

Investigations of the reliability of the TPAI have been conducted using videotaped and actual teacher performance in the classroom. Studies of interrater agreement in both settings (Johnson et al., 1978; Lovelace &

Martin, 1984) and internal consistency analyses (Johnson et al., 1978; Okey et al., 1978) yielded reliability indices ranging from .85 to .93, providing evidence for the reliability of the TPAI and the assessment process.

Procedures

As one of several requirements for admission to the Teacher Education Program, all study subjects took the PPST between September of 1985 and December of 1989. Subjects registered to take the PPST through the Counseling and Testing Center, Idaho State University, an Educational Testing Service designated testing site. The examinations were administered by Testing Center personnel at the Education Building, Idaho State University, on pre-announced testing dates. The University has contracted with Educational Testing Service for the scoring of the PPST and the forwarding of score reports that are then placed in Department of Education, Idaho State University files.

Student teacher performance was measured by three instruments from the Teacher Performance Assessment Instruments (Capie et al., 1979): (1) the Teaching Plans and Materials Instrument, (2) the Classroom Procedures Instrument, and (3) the Interpersonal Skills Instrument. Approximately two and one-half hours were required for each observation of a student teacher with the three instruments: one hour to examine the instructional unit plans prepared by the student teacher and one and one-half hours to interview and actually observe the student teacher in the classroom environment. A total of 38 raters, public school teachers and administrators and Idaho State University faculty members, were trained to

observe the student teachers using the TPAI. During training sessions, raters examined sample instructional unit plans, observed videotapes, and rated teachers' performances using the three instruments of the TPAI. Following training, the raters observed and rated a videotaped lesson and interrater reliability for the observations was computed. Interrater reliability of the 38 raters using the TPAI indicated classroom observation agreement rates of approximately 91%.

Each of the raters was assigned 2-8 student teachers during each semester. The raters were responsible for rating the student teacher's instructional unit, interviewing the student teacher, and then observing the student teacher for the duration of a lesson in the student teacher's assigned classroom. A total of three ratings/observations were completed for each student teacher during the last six weeks of the student teacher's second teaching assignment (i.e., during the last 6 of 18 weeks of student teaching practicum).

In addition to the classroom observations, raters collected the following demographic data for each student teacher: gender, age, certification type (i.e., elementary, secondary, etc.), and paraprofessional teaching experience. Cumulative grade point average, ACT scores, and PPST scores were gathered by the principal investigator from Idaho State University Department of Education files with the permission of the study participants. Coding sheets for each student teacher summarizing TPAI scores, ACT scores, PPST scores, grade point average, and demographic data were then completed by the principal investigator.

Data Analysis

Pearson product moment correlations were computed to determine the extent of the relationships between ACT subtest scores (English, Mathematics, Social Studies, Science, and Composite), PPST subtest scores (Writing, Reading, and Mathematics), grade point average, and TPAI scores (Teaching Plans and Materials, Classroom Procedures, and Interpersonal Skills). In addition, a multiple regression analysis was conducted in order to investigate the factors that predict student teacher performance. The TPAI total score was the criterion variable and predictor variables included ACT scores, PPST scores, cumulative grade point average, age, gender, and paraprofessional teaching experience.

Results

Because the data were collected within the constraints of an actual academic setting, complete sets of data were not always available. Pairwise and listwise deletion procedures were used to accommodate to this situation, the choice depending on the nature of the analysis and the requirements of the statistical method employed.

Correlations

The correlations for ACT subtest scores, PPST subtest scores, and grade point average are presented in Table 1. The n for each correlation is shown in parentheses between the correlations. The discrepancy between n's for the PPST and ACT scores is attributable to circumstances where scores were not available during the course of the study. All correlations are statistically significant at the .01 level and beyond.

In general, the correlations between the ACT Composite, PPST scores,

Table 1

Correlations Between Grade Point Average, ACT Scores, and PPST Scores

Variable	GPA	PPST Reading	PPST Writing	PPST Mathematics
Grade Point Average		.72 (607)	.65 (607)	.62 (607)
ACT English	.71 (583)	.62 (580)	.73 (580)	.52 (580)
ACT Mathematics	.63 (583)	.49 (580)	.46 (580)	.77 (580)
ACT Social Studies	.66 (583)	.67 (580)	.49 (580)	.42 (580)
ACT Science	.59 (583)	.56 (580)	.45 (580)	.51 (580)
ACT Composite	.64 (583)	.72 (580)	.63 (580)	.70 (580)

Note. Numbers in parentheses denote n.
All correlations, $\rho < .01$ and beyond.

and grade point average are of a high order of magnitude ranging from .42 to .72. The ACT Composite score has correlations of .72, .63, and .70 respectively with the PPST scores of Reading, Writing and Mathematics and a correlation of .64 with grade point average. Thus, the ACT Composite score accounts for 52%, 40%, and 49% respectively of the variances in the three PPST subtest scores and 41% of the variance in grade point average.

The highest ACT correlates of each PPST subtest, and vice versa, were identified. The highest ACT correlate of PPST Reading is the ACT Composite score (.72). For PPST Writing it is ACT English (.73), and for PPST Mathematics it is ACT Mathematics (.77). The highest PPST correlate of ACT Social Studies is PPST Reading (.67), and the highest PPST correlate of ACT Science is also PPST Reading (.56). These data suggest the importance of verbal skills, especially reading, to performance on measures of academic achievement.

The highest ACT and PPST correlates with grade point average were also identified. The highest ACT correlate with grade point average is the ACT English scores (.71). For the PPST, the highest correlate with grade point average is PPST Reading (.72). As with the ACT and PPST correlates, these data suggest the pervasive importance of verbal skills in the determination of academic achievement.

The correlations for TPAI subtest scores and the academic measures (i.e., ACT subtest scores, PPST subtest scores, and grade point average) are presented in Table 2. Again, the *n* for each correlation is shown in parentheses between the correlations and the discrepancy between *n*'s is attributable to circumstances where ACT or PPST scores were not available.

Table 2

Correlations Between TPAI Scores and Academic Measures

Variables	TPAI Teaching Plans	TPAI Classroom Procedures	TPAI Interpersonal Skills	TPAI Total
Grade point average	.22* (610)	.19 (610)	.13 (610)	.19 (610)
ACT English	.23* (583)	.28** (583)	.22* (583)	.25* (583)
ACT Mathematics	.10 (583)	.11 (583)	.09 (583)	.10 (583)
ACT Social Studies	.15 (583)	.17 (583)	.16 (583)	.16 (583)
ACT Science	.17 (583)	.13 (583)	.11 (583)	.12 (583)
ACT Composite	.16 (583)	.18 (583)	.14 (583)	.16 (583)
PPST Reading	.19 (607)	.29** (607)	.23* (607)	.24* (607)
PPST Writing	.13 (607)	.13 (607)	.17 (607)	.15 (607)
PPST Mathematics	.12 (607)	.09 (607)	.11 (607)	.10 (607)

Note. Numbers in parentheses denote
** $\rho < .01$
* $\rho < .05$

In general, the correlations between ACT scores and TPAI scores are of a low order of magnitude ranging from .10 to .28. Of the 20 correlations, 4 are significant: the ACT English score has correlations of .23 ($\rho < .05$), .28 ($\rho < .01$), .22 ($\rho < .05$) respectively with the TPAI Teaching Plans and Materials, Classroom Procedures, Interpersonal Skills, and total scores. Thus, the ACT English score accounts for 5%, 8%, 5%, and 6% respectively of the variance of the TPAI subtest and total scores. These data suggest the possible underlying importance of verbal skills to teaching planning and procedures and interpersonal skills.

Relative to relationships between PPST and TPAI scores, the correlations are in general of a low order of magnitude ranging from .09 to .29. Of the 12 correlations, 3 are significant: the PPST Reading score has correlations of .29 ($\rho < .01$), .23 ($\rho < .05$), and .24 ($\rho < .05$) respectively with the TPAI Classroom Procedures, Interpersonal Skills, and total scores. Thus, the PPST Reading score accounts for 8%, 5%, and 6% respectively of the variance of two of the TPAI subtest scores, Classroom Procedures and Interpersonal Skills, and the TPAI total score. These data again suggest the possible underlying importance of verbal skills, specifically reading, to classroom teaching procedures and interpersonal skills.

Regarding the relationships between grade point average and TPAI scores, the correlations are again in general of a low order of magnitude ranging from .13 to .22. Of the 4 correlations, one is significant: grade point average has a correlation of .22 ($\rho < .05$) with the TPAI Teaching Plans and Materials score. Thus, grade point average accounts for 5% of

the variance in scores of one subtest of the TPAI, Teaching Plans and Materials. These data suggest that subject matter knowledge as reflected by grade point average has possible underlying importance to teaching planning and selection of instructional objectives and materials.

Multiple Regression Analysis

Following the calculation of correlation coefficients, a step-wise multiple regression analysis was performed in order to determine the variables that predict student teacher performance, in which combination and to what extent. The TPAI total score was the criterion variable and predictor variables included grade point average, ACT scores, PPST scores, paraprofessional teaching experience, age, and gender. The reduction of the sample to 580 is attributable to circumstances where ACT or PPST scores were not available for student teachers.

Table 3 summarizes the results of the multiple regression analysis. Four variables contributed significantly ($\rho < .05$) to the prediction of TPAI total scores: PPST Reading scores, ACT English scores, paraprofessional teaching experience as a substitute teacher, and grade point average. The proportion of variance in TPAI scores attributable to the composite set of four significant variables is approximately .29. Thus, approximately 29% of the variance in student teacher classroom performance is accounted for by the composite set of predictors.

Conclusions

In response to the demand for improved teacher quality, many teacher education institutions have mandated policies requiring minimum ACT scores, PPST scores, and/or grade point averages prior to program entrance. The

Table 3

Multiple Regression Analysis

Independent Variables	*B*	*R*	R^2
PPST Reading	4.180	.541	.293
ACT English	2.053		
Paraprofessional teaching experience: Substitute teacher	-.254		
Grade point average	.281		
Additive constant	52.384		

stated goal of academic screening prior to teacher education is to predict the effectiveness of future teachers in the classroom in order to control the quality of individuals entering the profession (Murray, 1986). Mandates calling for academic screening to identify "persons expected to be effective teachers" precipitated the present study examining the extent to which ACT scores, PPST scores, and grade point average predict student teacher classroom performance.

Academic measures, including standardized tests and college grades, were weak predictors of actual classroom performance of student teachers in the present study based on the Teaching Plans and Materials, Classroom Procedures, and Interpersonal Skills instruments of the TPAI. While the ACT, PPST, and grade point average may serve as measures of student teachers' subject matter knowledge and verbal skills, they do not reveal how well the student teachers will actually perform in the classroom. These academic measures did not predict teaching performance of the student teachers in the study and, thus, do not strongly suggest themselves as criteria for teacher education program admission.

Why are academic measures such poor predictors of teacher classroom performance? Any score on a standardized test of knowledge in general or professional education is bound to measure only a sample of the important qualities necessary to be a successful teacher. Many of these qualities have less to do with knowledge of subject matter than with management and planning strategies within the classroom. Screening for entrance to teacher education has many facets, only some of which are addressed by standardized tests and college grades.

Data from the present study revealed relationships between the subtest and composite scores of the ACT, subtest scores of the PPST, and grade point average. The highest magnitude correlations were found for PPST Reading and ACT English with all other subtest scores and college grades. These data are suggestive of the importance of verbal skills, especially reading, to academic achievement.

From this foundation of interrelationships between academic measures emerges empirical evidence indicating that the ACT, PPST, and college grades may provide redundant information. Therefore, the question can be legitimately raised about whether it is wasteful of time, energy, and money to administer the ACT before admission to college and then to administer the PPST, which seems to measure much the same thing, two years later. The answer to this question must come from a combination of empirical evidence and practical judgement with consideration for the requirements and issues that characterize individual teacher education programs.

Selecting students qualified for teacher education has many facets, only some of which are addressed by standardized tests and college grades. The role of academic screening is to provide the basis for judgement, in the absence of opportunity for direct observation, that prospective teachers have reached a level of subject matter knowledge necessary for beginning teachers. Therefore, the ACT, PPST, and college grades may be necessary but not sufficient ingredients in understanding what kind of teachers we want in our classrooms. Academic measures are directly tied to a knowledge base, not to performance in the classroom where many additional and more complex factors come into play. As such, a multiple-criteria

approach to screening for teacher education should be employed combining written, interactive, and demonstration components including academic measures and personological variables such as motivation and professional commitment.

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